INSTALLATION INSTRUCTIONS

ALPHA

ELECTRIC
WARM AIR FURNACE

BY
IMPACT DISTRIBUTION

Save these instructions for reference

This furnace must be installed by a certified installer
and where required by law, a licenced technician.

FOR SERVICE CALL:

INSTALLATION INFORMATION

_____	_____
Qualified Contractor	Telephone Number
_____	_____
Unit Model Number	Unit Serial Number

_____

Date of Installation

MANUFACTURED BY
SUMMERAIRE MANUFACTURING
EXCLUSIVELY FOR
IMPACT DISTRIBUTION

INSTALLATION

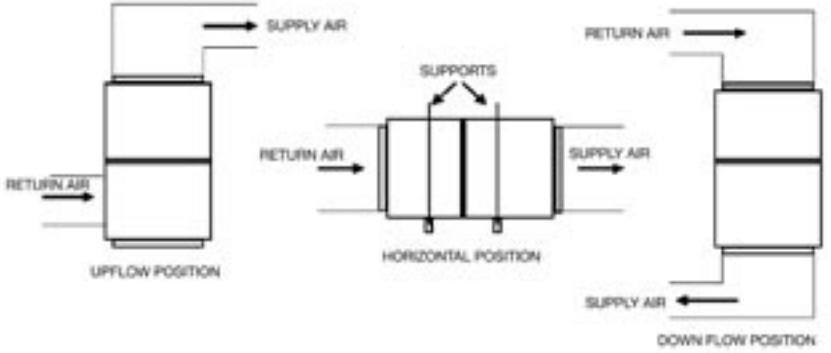
GENERAL INSTRUCTIONS
ALPHA series electric furnaces are designed, built and inspected to provide safe and dependable operation when properly installed in compliance with all National and Local Codes.
The Alpha series of warm air electric furnaces are available in the following models; 10kW,15kW,18kW, 20kW, 23kw and 27kW outputs .

ELECTRICAL
All electrical equipment and wiring shall be installed following the requirements Canadian or U.S.A. National Codes.

These electric furnaces require 120/240 vac, 1 phase , 60 Hz – 3 wire power supply (C/W neutral).

LOCATION
The furnace shall be centrally located in relation to the outlet registers, with suitably sized warm air ducts, for improved heat distribution.

MULTI POSITION
Alpha series electric warm air furnaces can be installed for vertical, horizontal, or down flow operation.



NOTE: An optional " DownFlow " base shall be installed with units over 23 KW. All panels / doors must be secured in place prior to starting unit.
A filter frame C/W disposable filter is supplied to suit 20 x 20 x 1 filter.

The filter frame shall be installed on the side of the cabinet selected for the return air to enter the furnace; either side or bottom. NOT IN BACK OF CABINET.
Four knockouts are provided on each of the two sides and bottom of the furnace to locate R/A opening.

FEATURES
All models are completely pre - wired.
All " field " wiring shall be completed by the Installer to the terminal block provided on the main control board in the furnace.

INSTALLATION CLEARANCES FURNACE
As shipped the ALPHA series furnaces are Certified for "ZERO" clearance.
To facilitate servicing the unit, the "Front" clearance should be a minimum of 24".

OPERATING SEQUENCE

HEATING
The thermostat closes the R-W1/W2 circuit, - activating the controller and elements one by one. The blower starts at low speed at the same time as the first two elements come on.
Blower speed increases as the other elements turn on.
Furnace is factory set in modulation mode.
If modulation has been selected at the controller, the blower speed with adjust automatically to maintain the factory set discharge air temperature.
If modulation has not been selected, the blower will run at the factory set heating speed.
When the thermostat is satisfied, all elements turn off at once and the blower continues to run until either the preset discharge temperature is met or 1 minute, which ever occurs first.
Refer to fig.2 to select modulation.
Position 1 on switch SW2 turns heating modulation on and off.

COOLING
The thermostat closes the R-Y/G circuit,
thereby activating compressor relay. The blower starts at cooling speed.
Furnace is factory set in modulation mode.
If modulation is selected at the controller, the cooling sequence starts first at high speed blower for approximately 7 minutes (sensible mode) followed by approximately 7 minutes of lower speed blower (latent mode). This sequence repeats.
If modulation is deselected, cooling speed is fixed at high speed.
Refer to fig.2, SW2 position 2 to turn modulation ON or OFF.

Position 2 on switch SW2 turns cooling modulation on and off.

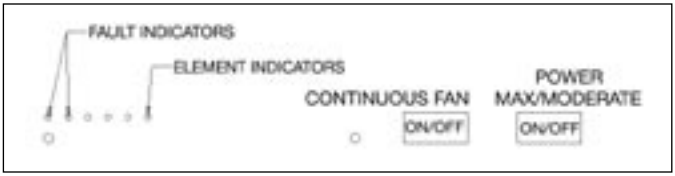
MANUAL CONTROLS

When thermostat calls for heat, the element indicator lights will illuminate as the elements turn on in sequence, the blower speed automatically adjusts as well.
When the POWER switch is in the "MODERATE" position, the furnace operates at reduced heating capacity.

REMEMBER, during the winter months, this switch should be in the "MAX" position to ensure maximum heating.

The POWER switch must also be set in the "MAX" position when a 2 – stage thermostat or outdoor thermostat is installed to control the electric elements of the second stage. Also, the wire jumper on the main control, positions W1/W2 must be removed.

The "CONTINOUS FAN" switch turns the blower on to continuous "LOW" speed. This feature will filter the air and provide for better distribution in the building.



WARNING

CAUTION

It is important to check airflow and make sure that the furnace does not operate above the temperatures specified in the Specifications (Table 1). This is particularly important if a cooling coil or a heat pump has been installed.
High Limit Thermal Protectors should never need to engage during normal operation of the furnace. The High Limit protectors are designed to engage during the improper functioning of the blower or when the filter has not been kept clean.

CHECKING HIGH LIMIT THERMAL SWITCHES

After 10 minutes of operation at full capacity, block the supply or return air opening. Record the supply air temperature at a point that is not exposed to radiant heat from the elements. The elements must shut down, before the temperature exceeds 93°C (200°F)

INSTALLING A HEAT PUMP WITH AN SE SERIES ELECTRIC FURNACE.

You may require a kit to prevent the simultaneous operation of the furnace elements and the heat pump. Refer to the instructions provided with the thermostat or the "fossil fuel" type kit for proper wiring of the furnace and the heat pump. Fossil fuel kit is not required if A/C Coil is installed in return air plenum.

DUCT

Duct work for furnaces up to and including 20KW can be installed with "zero" clearance to combustibles

THERMOSTAT WIRING

The thermostat shall be installed on an interior wall where it will not be affected by drafts, sun light, warm air diffusers, fireplaces etc. Follow the instructions that are supplied with the thermostat.

1 stage – electric heating only

2 stage – electric heating only

1 stage – thermostat with outdoor control for 2 stage function, electric heating only

2 stage thermostat, electric heating and air conditioning

1 Stage Thermostat, Electric Heating Only

When a digital thermostat is used, set this function to Gas or Oil Furnace.

ELEMENT RELAY SUBSTITUTION

TURN POWER SUPPLY OFF PRIOR TO PERFORMING THIS PROCESS. THIS PROCESS TO BE PERFORMED BY QUALIFIED TECHNICIAN ONLY!

WARNING, FAILURE TO FOLLOW PROPER PROCEDURES MAY RESULT IN SERIOUS HARM OR DEATH.

Included in the Alpha controller design is the ability to select alternate element relay use in the event of original relay failure.

This option permits the alternate selection of up to two (2) relays.

Refer to fig.1 to determine the correct dip switch settings to select alternate relays.

Selections are made at the 4 position dip switch on the controller labeled as SW1.

This switch is located immediately behind the W1/W2 thermostat connections.

To toggle the switch down towards the switch identifying numbers on the control,

turns it off.
To select alternate relays does not change the element LED display.
The power supply wire and the element wire must be moved to the replacement relay position.
Refer to Fig 1 and Fig 2.

COOLING DISCHARGE AIR SENSOR
A/C COIL INSTALLED DOWNSTREAM

The following must be observed when the A/C coil is mounted downstream of the furnace and the modulation mode of cooling is desired.
Note, all furnaces are factory supplied with the modulation mode selected.
If air conditioning is not installed simply leave sensor safely coiled up in control compartment.

The cooling discharge air sensor must be installed approximately 15" downstream of the A/C coil.
Drill a 3/8" diameter hole in the supply duct, install plastic Heyco bushing provided, insert sensor at least 2" into supply duct and secure sensor in place using plastic clip provided
Refer to fig.6.

A/C COIL INSTALLED UPSTREAM OF FURNACE
(OPTIONAL RETURN AIR SENSOR)
Recommended for Heat Pump applications.

The following must be observed when the A/C coil is installed upstream of the furnace.
Locate air filter upstream of A/C coil.
The return air temperature must be monitored to permit the controller to function.
To do this, the return air sensor must be installed in the return air duct upstream of the A/C coil.
Disconnect the "Disc Air Rem" sensor connector from the controller and connect on to "Ret Air Rem" receptacle on controller and route to outside of cabinet through sleeved holes provided. Do not route sensor leads through the same openings as the power leads. Sensor leads must be routed away from power leads.
Drill a 3/8" diameter hole in the return air duct approximately 18" upstream of the A/C coil. Insert the Heyco bushing provided into the hole.
Insert the sensor lead end into the return air duct approximately 2" and secure into place using the plastic clip provided.
Refer to fig.6.

Fig 1

RELAY SUBSTITUTION DIP-SWITCHES
Switch SW1

All furnaces are factory supplied with all switches set to the off position
The relay dipswitch is located on the main control board

- SW1selections will select relay to be disabled and the new relay to be enabled.
- SW2 positions 1 and 2 labeled MOD will select modulation options.
  DO NOT CHANGESWITCH POSITIONS 3 to 6.

In the tables below a switch ON is represented by a value “1” while a switch OFF is represented by a value “0”.

The following tables highlight valid selection for each furnace size

Switch Position	Old Relay	New Relay
Two Element Furnace		
0100	1	3
1100	1	4
0010	1	5
1010	1	6
0110	2	3
1110	2	4
0001	2	5
1001	2	6
0101	3	4
1101	3	5
0011	3	6
1011	4	5
0111	4	6

Switch Position	Old Relay	New Relay
Three Element Furnace		
1100	1	4
0010	1	5
1010	1	6
1110	2	4
0001	2	5
1001	2	6
0101	3	4
1101	3	5
0011	3	6
1011	4	5
0111	4	

Switch Position	Old Relay	New Relay
Four Element Furnace		
0010	1	5
1010	1	6
0001	2	5
1001	2	6
1101	3	5
0011	3	6
1011	4	5
0111	4	6

Switch Position	Old Relay	New Relay
Five Element Furnace		
1010	1	6
1001	2	6
0011	3	6
0111	4	6

Fig 2

MAIN CONTROL BOARD

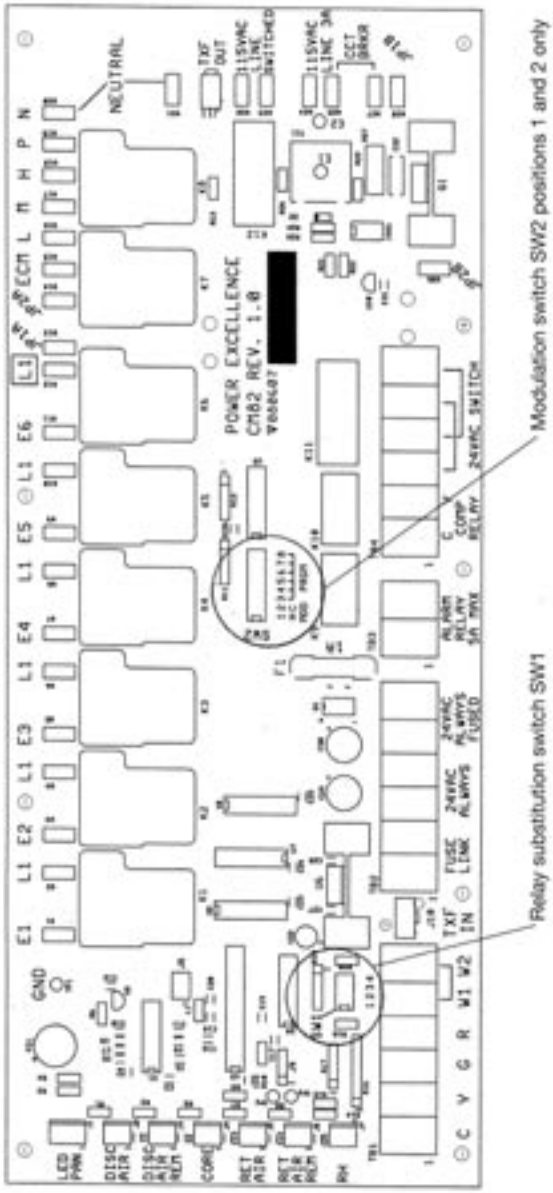


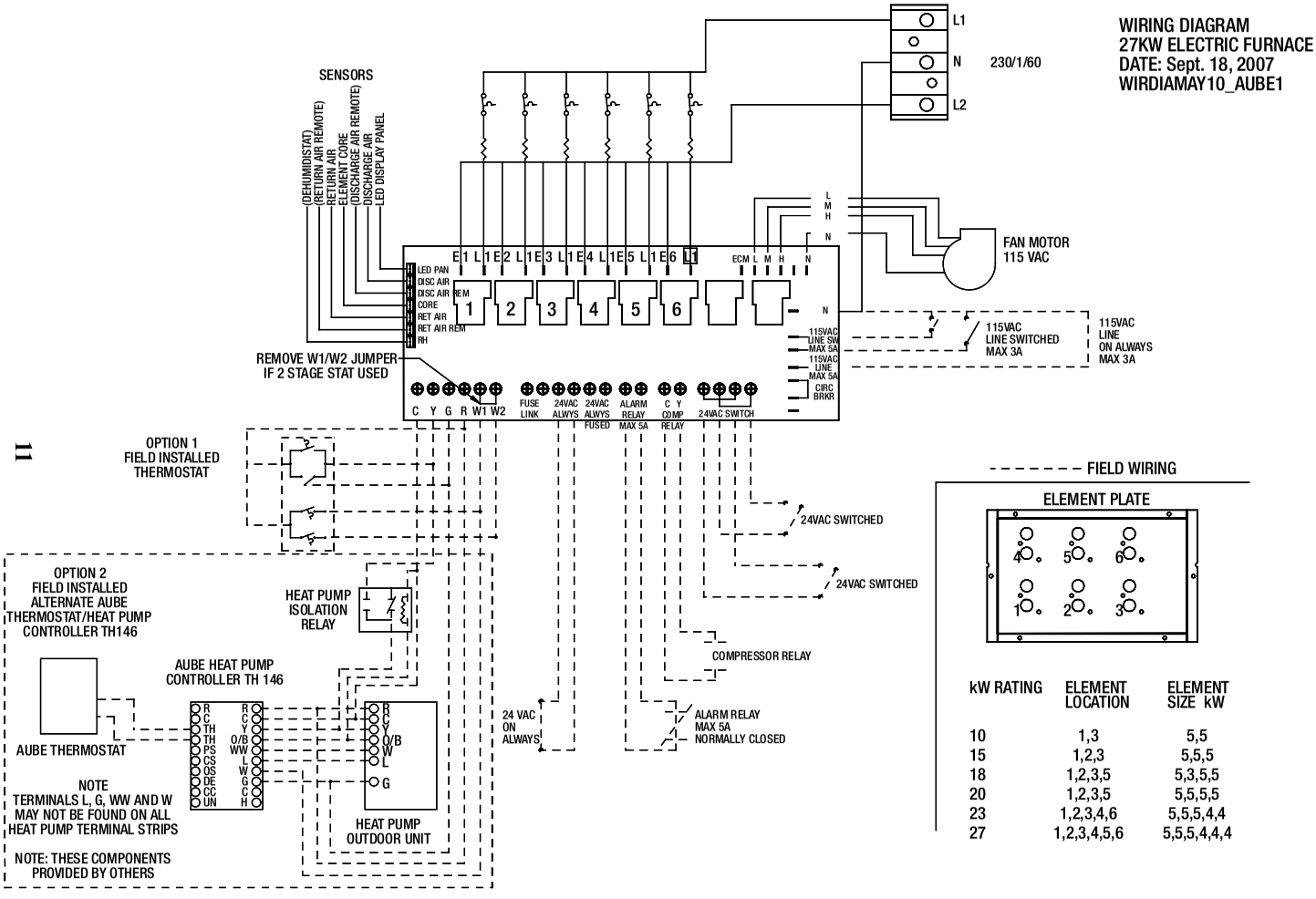
Fig 3

CONTROL BOARD FAULT CONDITIONS AND DISPLAY

Fault conditions are recognized and displayed by the Upper LED display panel
Only overheating and overcooling conditions are displayed at the element LEDs. These conditions are likely the result of poor air flow resulting from dirty air filters.
All other conditions are displayed by the LED located on the backside of the LED panel.
Simply count the number of flashes at the single element panel fault LED and refer to the chart below.
NOTE, to view the LED panel fault indicator LED the front control cover must be removed.
This sequence should only be performed by a qualified contractor.
WARNING, HIGH VOLTAGE IS PRESENT IN THE CONTROL COMPARTMENT, SERIOUS INJURY OR DEATH MAY RESULT IF PROPER PRECAUTIONS ARE NOT FOLLOWED.

Fault Condition	Number Flashes	Element LED Flashes	Resulting Controller Action
Excessive fan motor amp draw	1	none	All outputs turned off Alarm relay on Alarm beeper on
No current draw At fan motor	2	none	All outputs turned off Alarm relay on Alarm beeper on
Failed RA sensor	3	none	
Failed RAR sensor	4	none	
Failed DA sensor	5	none	
Failed DAR sensor	6	none	
Failed CT sensor	7	none	
Overheating	8	Element 1	
Overcooling	9	Element 2	
Crfitical Overheat	10	Element 1 & 2	
Thermostat error	11	none	

WIRING DIAGRAM
27KW ELECTRIC FURNACE
DATE: Sept. 18, 2007
WIRDIAMAY10_AUBE1

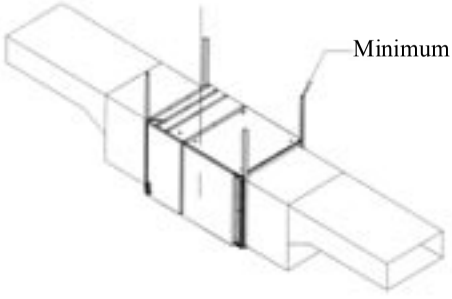


kW RATING	ELEMENT LOCATION	ELEMENT SIZE kW
10	1,3	5,5
15	1,2,3	5,5,5
18	1,2,3,5	5,3,5,5
20	1,2,3,5	5,5,5,5
23	1,2,3,4,6	5,5,5,4,4
27	1,2,3,4,5,6	5,5,5,4,4,4

Fig 4

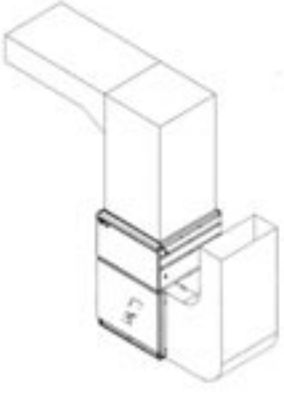
Horizontal Installation

NOTE: Return air opening must be cut out to knockouts provided.
Minimum return air opening size, 18" X 18".
Caution: Return air openings shall not be installed in back panel.



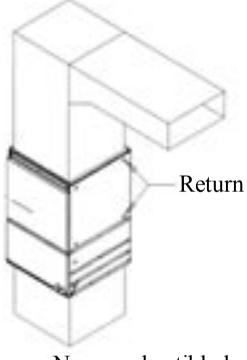
NOTE: Field selected suspension materials must be sized by the installing contractor and be of sufficient strength to support air handler weight of 100 lbs and connected accessory fittings and materials.

Upflow Installation



Counterflow Installation

Supply air plenum must be constructed of suitable materials and sized by installing contractor so as to be of sufficient strength to support furnace and accessory fittings and materials.

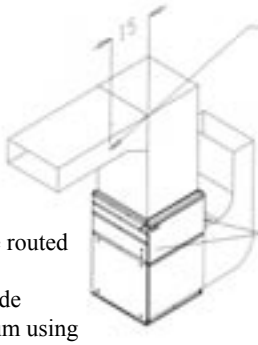


Non combustible base required

Fig 5

Fig 6

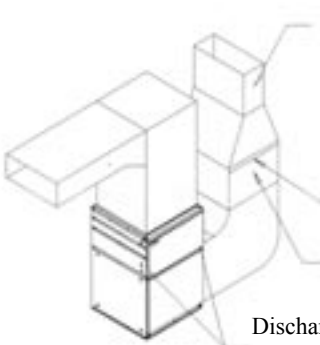
Temperature Sensor and
Low voltage lead routing
A/C Coil installed Downstream
of Furnace



Drill 3/8” dia hole in warm air duct a minimum of 15” upstream of plenum. Install RAR sensor. (return air remote)
Snap round bushing into hole and insert sensor lead approximately 2” and secure to duct using nylon strap included.

Discharge sensor lead and low voltage lead wires shall be isolated from high voltage leads and routed through knockouts provided.

Discharge sensor lead shall be routed out of furnace casing through knockout provided in either side of casing and secured to plenum using nylon clips provided.



Drill 3/8” dia hole in warm air duct a minimum of 15” upstream of plenum. Install RAR sensor. (return air remote)
Snap round bushing into hole and insert sensor lead approximately 2” and secure to duct using nylon strap included.

Air Filter

A/C Coil drain must be trapped.

Discharge sensor lead and low voltage lead wires shall be isolated from high voltage leads and routed through knockouts provided.

ELECTRIC FURNACE PRESTART CHECKLIST

❑ 1. REMOVE PACKING MATERIALS FROM LEFT SIDE OF BLOWER

❑ 2. CONFIRM DIP SWITCH SETTINGS AS FOLLOWS

❑ 3. DISCHARGE AIR SENSOR INSTALLED AFTER A/C COIL

❑ 4. LOW HEAT/HIGH SELECT SWITCH SET TO HIGH HEAT. (UNLESS OTHERWISE SELECTED)

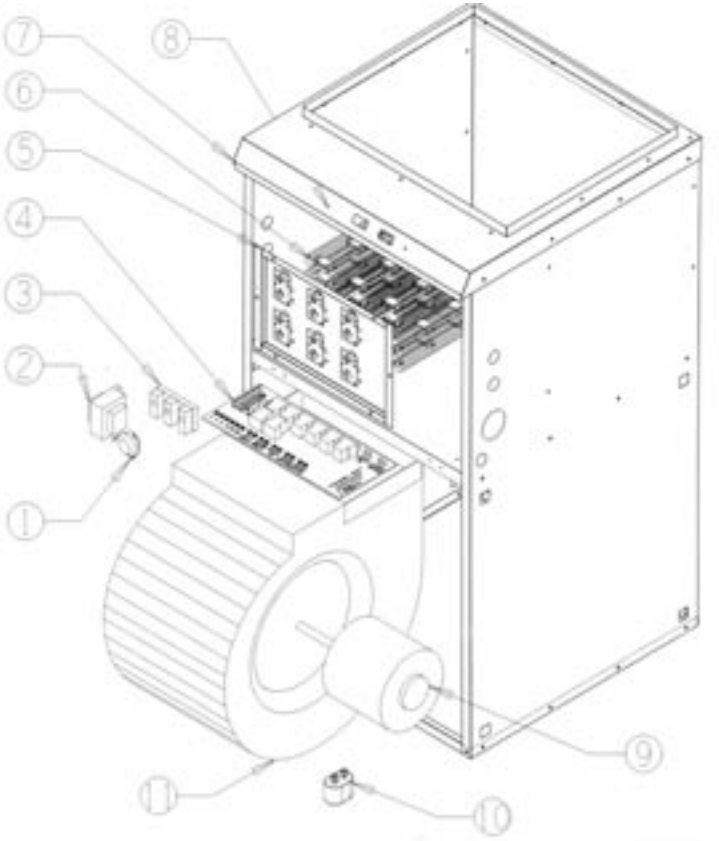
❑ 5. INITIATE CALL FOR HEAT.
ELEMENT LEDS ILLUMINATE AS ELEMENTS TURN ON,
FAN MOTOR SPEED INCREASES AS ELEMENTS TURN ON
RECORD FULL AMP DRAW AT FULL POWER

❑ 6. CANCEL CALL FOR HEAT
ELEMENT LEDS TURN OFF.
APPROXIMATELY 1 MINUTE LATER, FAN TURNS OFF
(PROVIDED THAT CONTINUOUS FAN HAS NOT BEEN SELECTED)

❑ 7. INTERRUPT POWER TO OUTDOOR CONDENSOR.
INITIATE CALL FOR COOLING,
ONCE FURNACE FAN IS RUNNING, CONFIRM 24 VOLT OUTPUT AT Y AND C AT COMP RELAY
RECONNECT POWER TO CONDENSOR IF TEST SUCCESSFUL
NOTE: MAIN CONTROL DELAY INTERVAL BETWEEN COOLING CYCLES MAY DELAY COOLING RESTART UP TO 5 MINUTES.

❑ 8. CANCEL CALL FOR COOLING
APPROXIMATELY 1 MINUTE LATER, FAN TURNS OFF
(PROVIDED THAT CONTINUOUS FAN HAS NOT BEEN SELECTED)

PARTS



ITEM	PART NUMBER
1 ELEMENT LIMIT CONTROL	2.LIMIT3LO1130
2 TRANSFORMER	2.TRANS40VA24
3 MAIN TERMINAL BLOCK	8.TBMAIN
4 CONTROLLER	2.BOARDSE6
5 ELEMENT PLATE	2.ELMPLTE
6 ELEMENT	2.ELEMENT3, 2.ELEMENT4, 2.ELEMENT5
7 LED PANEL	2.PANLED
8 SELECTOR SWITCH	2.SWITCHRCKR
9 FAN MOTOR	2.MTRDDO25 (1/3HP), 2.MOTOR5845A
10 MOTOR CAPACITOR	2.CAP370V5MF(1/3HP),2.CAP370V15MF(3/4HP)
11 BLOWER	2.BLOWER10208, 2.BLOWERGT1210
CAPACITOR BOOT(not shown)	2.CAPBOOT
CIRCUIT BREAKER(not shown)	2.BRKR16A

SPECIFICATIONS

KW RATING	10	15	18	20	23	27
OUTPUT - B.T.U.H.	34120	51180	61416	68240	78480	92130
TEMPERATURE RISE - RANGE °F	40-50	45-60	50-70	55-75	60-80	60-80
MOTOR AMPS	5	5	5	5	5	10.7
HEATING ELEMENT AMPS	43	64	76	83	99	116
TOTAL AMPS *	48	69	81	88	104	120
MINIMUM CIRCUIT AMPS	60	85	100	110	125	150
BREAKER SIZE - AMPS	60	90	100	125	125	150
MOTOR H.P. - SPEEDS	1/3 HP - 3 SPEED					3/4 HP - 3 SPEED
BLOWER	AIRDEX-1020-800-5					DELHI-GT12-10
GENERAL INFORMATION						
DIMENSIONS WIDTH x DEPTH x HEIGHT	20" W x 21" D x 36" H		RETURN AIR PLENUM		18 1/2" x 18 1/2"	
WARM AIR PLENUM	15" x 18"		AIR FILTER - 1 REQUIRED		20" x 20" x 1"	
SHIPPING WEIGHT	48 KG (105 Lbs.)					
AIR CONDITIONING	UP TO 3 TONS					UP TO 5 TONS

* INCLUDES 5 AMPS FOR BLOWER MOTOR AND 2 AMPS FOR EXTERNAL DEVICES.